

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1–11. (Canceled)

12. (previously presented) A clock control system for generating a clock signal having an operating frequency set to a nominal operating frequency corresponding to a maximum rated junction temperature, comprising:

a thermal sensor operative to produce a temperature signal corresponding to a junction temperature of at least a portion of a circuit on a die;

a thermal sensor control circuit, operatively coupled to the thermal sensor, and operative to produce temperature data in response to the temperature signal and to provide a control signal in response to the temperature data;

a clock generator circuit operative to produce the clock signal; and

a dynamic overclock frequency control data generator, operatively coupled to the thermal sensor control circuit and the clock generator circuit, and operative to provide dynamic overclock frequency control data to the clock generator circuit in response to the control signal and the received temperature data to cause the clock generator circuit to increase the operating frequency of the clock signal above the nominal operating frequency, when the detected junction temperature is less than the maximum rated junction temperature.

13. (previously presented) The clock control system of claim 12 wherein the dynamic overclock frequency control data generator is operative, in response to the control signal, to

provide hysteresis based frequency control to increase the operating frequency of the clock signal above the nominal operating frequency if the detected junction temperature is below a lower junction temperature threshold, and to decrease operating frequency of the clock signal below the nominal operating frequency if the detected junction temperature is above an upper junction temperature threshold, wherein the upper junction temperature threshold is greater than the lower junction temperature threshold.

14. (canceled)

15. (previously presented) The clock control system of claim 12 wherein the thermal sensor control circuit is operative to produce the control signal in response to a comparison between the temperature data and the threshold temperature data.

16. (previously presented) The clock control system of claim 12 wherein the dynamic overclock frequency control data generator is operative to reduce at least one of: the frequency of the clock signal and a supply voltage to at least the portion of the circuit on the die in response to the control signal and if the first junction temperature is above a junction temperature threshold.

17. (previously presented) In a system comprising a host processor and a graphics co-processor, a method for generating a clock signal for the graphics co-processor, the clock signal having an operating frequency set to a nominal operating frequency corresponding to a maximum rated junction temperature, the method comprising:

detecting, by a thermal sensor coupled to the graphics co-processor, a junction temperature corresponding to at least a portion of a circuit on a die constituting at least a portion of the graphics co-processor, thereby providing a temperature signal;

providing, by a thermal sensor control circuit coupled to the thermal sensor, a control signal and temperature data in response to the temperature signal; and

causing, by the host processor coupled to the thermal sensor control circuit and in response to the control signal and the temperature data, an increase in the operating frequency of the clock signal above the nominal operating frequency, when the detected junction temperature is below the maximum rated junction temperature.

18. (previously presented) The method of claim 17 further including decreasing, by the host processor in response to the control signal, the operating frequency of the clock signal below the nominal operating frequency when the detected junction temperature is below the maximum rated junction temperature.

19. (previously presented) The method of claim 18 further including providing hysteresis based frequency control by:

decreasing, by the host processor in response to the control signal, the operating frequency of the clock signal if the detected junction temperature is above an upper junction temperature threshold, and

increasing, by the host processor in response to the control signal, the operating frequency of the clock signal if the detected junction temperature is below a lower junction

temperature threshold wherein the upper junction temperature threshold is greater than the lower junction temperature threshold.

20–33. (Canceled)

34. (new) A clock control system for generating a clock signal having an operating frequency set to a nominal operating frequency corresponding to a maximum rated junction temperature, comprising:

- a thermal sensor operative to produce a temperature signal corresponding to a junction temperature of at least a portion of a circuit on a die;

- a thermal sensor control circuit, operatively coupled to the thermal sensor, and operative to produce temperature data in response to the temperature signal and to provide a control signal in response to the temperature data;

- a clock generator circuit operative to produce the clock signal; and

- a dynamic overclock frequency control data generator, operatively coupled to the thermal sensor control circuit and the clock generator circuit, and operative to provide dynamic overclock frequency control data to the clock generator circuit in response to the control signal and the received temperature data to cause the clock generator circuit to increase the operating frequency of the clock signal above the nominal operating frequency, when the detected junction temperature is less than the maximum rated junction temperature; and

- memory comprising data representing a lookup table containing junction temperatures over a temperature operating range with corresponding clock signal frequencies.

35. (new) A clock control system for generating a clock signal having an operating frequency set to a nominal operating frequency corresponding to a maximum rated junction temperature, comprising:

a thermal sensor operative to produce a temperature signal corresponding to a junction temperature of at least a portion of a circuit on a die;

a thermal sensor control circuit, operatively coupled to the thermal sensor, and operative to produce temperature data in response to the temperature signal and to provide an interrupt signal in response to the temperature data;

a clock generator circuit operative to produce the clock signal; and

a dynamic overclock frequency control data generator, operatively coupled to the thermal sensor control circuit and the clock generator circuit, and operative to provide dynamic overclock frequency control data to the clock generator circuit in response to the interrupt signal and the received temperature data to cause the clock generator circuit to increase the operating frequency of the clock signal above the nominal operating frequency, when the detected junction temperature is less than the maximum rated junction temperature.

36. (new) The clock control system of claim 35 comprising memory comprising data representing a lookup table containing junction temperatures over a temperature operating range with corresponding clock signal frequencies.